

**We claim:**

- 09674047-102500
1. A reactor for the catalytic oxidation of ammonia to nitrogen oxides, which  
5 contains a noble metal gauze catalyst and a heat exchanger in that order in  
the direction of flow and has a catalyst for the decomposition of  $N_2O$   
located between the noble metal gauze catalyst and the heat exchanger.
  2. A reactor as claimed in claim 1, wherein a noble metal recovery gauze is  
10 located between the noble metal gauze catalyst and the catalyst for the  
decomposition of  $N_2O$ .
  3. A reactor as claimed in claim 1 or 2, wherein the catalyst for the  
15 decomposition of  $N_2O$  is installed as a fixed bed having a height of from 2  
to 50 cm.
  4. A reactor as claimed in any of claims 1 to 3, wherein the catalyst for the  
20 decomposition of  $N_2O$  can be prepared by combining  $CuAl_2O_4$  with tin,  
lead and/or an element of main group II or transition group II of the  
Periodic Table of the Elements as oxide or salt or in elemental form and  
subsequently calcining the mixture at from 300 to 1300°C and a pressure in  
the range from 0.1 to 200 bar.
  5. An apparatus for preparing nitric acid from ammonia, comprising in this  
25 order
    - a reactor as claimed in any of claims 1 to 4,
    - an absorption unit for the absorption of nitrogen oxides in an aqueous  
medium and, if desired,
    - 30 - a reduction unit for the selective catalytic reduction of nitrogen oxides.
  6. A process for the catalytic decomposition of  $N_2O$  in a gas mixture obtained  
35 in the preparation of nitric acid by catalytic oxidation of ammonia, where  
the  $N_2O$  is decomposed catalytically over a catalyst for the decomposition  
of  $N_2O$ , wherein the hot gas mixture obtained from the catalytic oxidation  
of ammonia is brought into contact with the catalyst for the decomposition  
of  $N_2O$  prior to subsequent cooling.

7. A process as claimed in claim 6, wherein the residence time over the catalyst for the decomposition of  $N_2O$  is less than 0.1 s.
- 5 8. A process as claimed in claim 6 or 7, wherein the decomposition of  $N_2O$  is carried out at from 600 to 950°C and/or at a pressure in the range from 1 to 15 bar.
- 10 9. A process as claimed in any of claims 6 to 8, wherein the catalyst for the decomposition of  $N_2O$  can be prepared by combining  $CuAl_2O_4$  with tin, lead and/or an element of main group II or transition group II of the Periodic Table of the Elements as oxide or salt or in elemental form and subsequently calcining the mixture at from 300 to 1300°C and a pressure in the range from 0.1 to 200 bar.
- 15 10. The use of a catalyst as defined in claim 9 for the decomposition of  $N_2O$  in a reactor for the catalytic oxidation of ammonia.

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A1

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